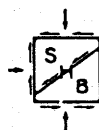


LABORATORY TESTING PROCEDURES

Consolidation Tests Soiltest or Clockhouse apparatus of the "floating-ring" type are employed for the one-dimensional consolidation tests. They are designed to receive one inch high 2.5 inch O.D. brass liner rings with soil specimens as secured in the field. Procedures for the tests generally are those outlined in ASTM D2435. Loads are applied in several increments to the upper surface of the test specimen and the resulting deformations are recorded at selected time intervals for each increment. For soils which are essentially saturated, each increment of load is maintained until the deformation versus log of time curve indicates completion of primary consolidation. For partially saturated soils, each increment of load is maintained until the rate of deformation is equal or less than 1/10,000 inch per hour. Applied loads are such that each new increment is equal to the total previously applied loading. Porous stones are placed in contact with the top and bottom of the specimens to permit free addition or expulsion of water. For partially saturated soils, the tests are normally performed at in situ moisture conditions until consolidation is complete under stresses approximately equal to those which will be imposed by the combined overburden and foundation loads. The samples are then submerged to show the effect of moisture increase and the tests continued under higher loadings. Generally, the tests are continued to about twice the anticipated curve due to overburden and structural loads with a rebound curve then being established by releasing loads.

Expansion Tests The same type of consolidometer apparatus described above is used in expansion testing. Undisturbed samples contained in brass liner rings are placed in the consolidometers, subjected to appropriate surcharge loads and submerged. The loads are maintained until the expansion versus log of time curve indicates the completion of "primary swell".

Direct Shear Tests Direct shear tests are run using a Clockhouse or Soiltest apparatus of the strain-control of approximately 0.05 inches per minute. The machine is designed to receive one of the one inch high 2.42 inch diameter specimens obtained by tube sampling. Generally, each sample is sheared under a normal load equivalent to the effective overburden pressure at the point of sampling. In some instances, samples are sheared at several normal loads to obtain the cohesion and angle of internal friction. When necessary, samples are saturated and/or consolidated before shearing in order to approximate the anticipated controlling field loading conditions.



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TABULATION OF TEST RESULTS

Job No. E84-2011J

Date _____

Client: Kennecott
 1515 Mineral Square
 Salt Lake City, Utah 84147

Project Geotechnical Investigation Report
Conveyor Line Corridor

Material _____

HOLE NO.	LOCATION	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS - ACCUM. % PASSING										LAB. NO.		
						200	100	40	16	10	4	1/4	3/8	1/2	1	1 1/2	2	
C-1	See Site Plan	5'-6 1/2'	SC	38	17	34	44	54	64	70	80		92	100				1-2
		30'-31 1/2'	SM	35	10	48	57	64	69	72	78		84	80	93	100		1-7
		35'-36 1/2'	GC	42	24	31	40	47	53	57	63		70	86	100			2-2
C-2		5'-6 1/2'	SC	49	31	40	50	58	64	67	74		83	95	100			1-9
		20'-21 1/2'	GM	-	NP	27	35	41	45	49	56		68	83	94	100		1-12
		25'-26 1/2'	GC	25	7	24	29	34	37	39	46		58	70	86	100		1-13
		30'-31 1/2'	GC	29	13	34	43	48	51	53	58		66	84	100			2-6
C-3		5'-6 1/2'	SC	49	34	39	48	58	63	66	73		82	94	100			1-14
		20'-21 1/2'	SM	-	NP	19	37	90	99	100								1-17
		35'-36 1/2'	CL-ML	24	6	56	80	91	92	93	95		96	100				2-13
		50'-51 1/2'	GM	-	NP	23	33	40	43	45	51		56	66	79	100		2-16
C-4		1/2'-2'	SM	19	2	28	38	53	58	60	65		73	95	100			1-18
		10'-11 1/2'	SM	-	NP	33	48	70	94	100								1-20
C-5		2 1/2'-4'	GM	-	NP	12	19	25	29	34	45		61	77	95	100		1-24
		15'-16 1/2'	GM	-	NP	24	33	42	46	49	57		68	79	91	100		1-27

Job No. E84-2011J

Date: _____

Client: Kennecott
1515 Mineral Square
Salt Lake City, Utah 84147

Project _____
Geotechnical Investigation Report

Conveyor Line Corridor

Material.

Source -

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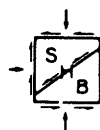
Geotechnical Investigation Report
Conveyor Line Corridor
Kennecott UCD Modernization Project
Salt Lake Coun-ty, Utah
SHB Job No. E84-2011J

REPORT ON LABORATORY TESTS

SUMMARY OF CHEMICAL TESTS

<u>Sample Location</u>	<u>pH</u>	<u>Electrical Conductance (EC) mhos/cm</u>	<u>Total Water Soluble Sulfate (504) percent</u>
Boring C-1 at 40' to 41-1/2'	4.80	6250	0.50
Boring C-2 at 10' to 11-1/2'	5.32	3700	0.54
Boring C-3 at 15' to 11-1/2'	4.28	4950	0.18
Boring C-6 at 5' to 6-1/2'	8.62	1025	0.033
Boring C-8 at 15' to 16-1/2'	9.50	810	0.005

Note: 1000 ppm = 0.10%



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